

Jewel Cave

National Park Service
U.S. Department of the Interior

National Monument
South Dakota



Beneath the Black Hills of South Dakota lies the fascinating underground world of Jewel Cave. It delights, it perplexes, and it lures you on to further explorations: to see a chamber decorated with glittering calcite crystals; to view a variety of

beautiful, colorful, and rare formations that make Jewel Cave world famous; or to experience its vast and intricate maze-like network of passages.

Nailhead spar formations (above) are readily seen on cave tours.

ALL PHOTOS THIS SIDE ©ARTHUR PALMER

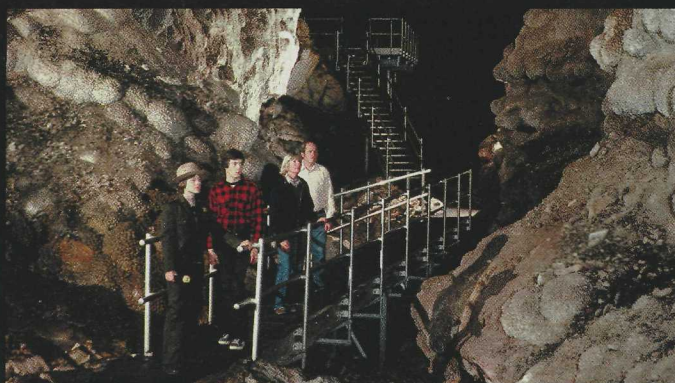
Underground Delights

When Jewel Cave National Monument was established in 1908, only a few of the cave's wonders had been discovered. Less than one mile of passages was known. Primary attractions were chambers lined with jewel-like calcite crystals.

Explorations in the past 45 years have revealed more of Jewel Cave's underground delights. Because the cave is a scientific gem, much of it has been set aside for research and is not open

to the public. But tour routes are designed so you can see many of the cave's wonders.

On a tour you can sense that Jewel Cave is not the small cave it was once thought to be. Today it is one of the world's longest caves, a labyrinth that twists and turns for miles. The most common theory is that Jewel Cave's creation was a process that took millions of years, starting with the formation of the Black Hills, when mountain-build-



Crystal-gazing on the Scenic Tour.

ing forces created faults in the Earth. About 30 to 50 million years ago, slightly acidic ground-water seeped into the faults, dissolving the surrounding limestone and—over several million years—hollowing out the passages of Jewel Cave. A variety of cave formations were created in later stages of cave development. You will see some of these splendid formations on your cave tour.



Water is Jewel Cave's interior designer. High off the floor on the Scenic Tour, three-foot-long drapery formations still grow as drops of water deposit calcite.

Drop by Drop

Water dripping into Jewel Cave over time created its variety of formations. Crystals of the mineral calcite, deposited from millions of droplets, make up the formations.

Where drops fall from the ceiling, stalactites form; where drops hit the floor, stalagmites grow; and where stalactites and stalagmites have merged, columns appear.

Water trickling down a slanted ceiling creates translucent draperies, and water flowing over a wall leaves behind flowstone. Where water still seeps into the cave, these formations are still taking shape.



A soda straw stalactite has nearly reached its companion stalagmite.



Stalactites on the cave ceiling eventually meet stalagmites on the cave floor and become a single column. These are seen on the Scenic Tour.

Calcite Crystals

Jewel Cave is named for its many rooms and passages covered with jewel-like crystals: some sparkle like gems when illuminated. This underground spectacle is created by the cave's abundant formations, the calcite crystals known as dogtooth spar and nailhead spar.

Examples of dogtooth and nailhead spar can be seen on all of the cave tours.



Dogtooth spar (right): each elongated, many-sided, crystal is pointed at the end.



Nailhead spar: each crystal is elongated, many-sided, and has a flat or blunted end.



Calcite crystals: the "jewels" of Jewel Cave.

Nearly all Jewel Cave chambers display impressive collections of calcite crystals. Other cave systems have them, but Jewel Cave's are some of the most extensive displays known. Crystals typically cover cave walls in crusts two to six inches thick or occur in deep pockets in walls. Individual crystals may be the same size as a grain of rice, your finger, or a goose egg.

Pure calcite crystals are translucent white. When iron oxides, other minerals, or impurities are mixed in, crystals may be red, yellow, or an opaque white. Large sections

of the cave's crystal lining appear gray and do not sparkle. These are covered with silt left from ancient times when water filled the cave. Water still seeps into the cave today and is cleansing some crystals of their gray coating.

The origin of these geometrically intriguing cave formations is only partially understood by speleologists—cave scientists. They now think that both dogtooth spar and nailhead spar developed under water and beneath Earth's surface. Dogtooth spar, most scientists

think, was formed hundreds of millions of years ago in small, deep, water-filled pockets. Later these crystal-lined pockets became part of Jewel Cave.

Nailhead spar was created more recently, about one to 40 million years ago, during the many times that Jewel Cave was completely or partially flooded. In the dogtooth spar and nailhead spar, dissolved calcite derived from limestone precipitated from the water and formed into the shape of calcite crystals.



Hydromagnesite balloons are found in only a few caves in the world.

Remarkable and Rare

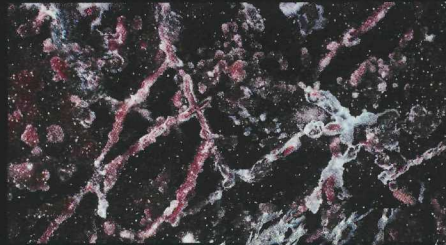
Jewel Cave's collection of underground formations includes some rare and unusual ones. Helictites, for example, are only inches long and twist and turn in all directions with no regard for gravity. Like most cave formations, helictites are made up of calcite, as is popcorn, which grows in small knobby clusters.

Delicate, needle-like cave decorations known as frostwork can be composed of calcite or a similar mineral, aragonite. Criss-crossing patterns of calcite veins called boxwork also occur in Jewel Cave, although they are more abundant in nearby Wind

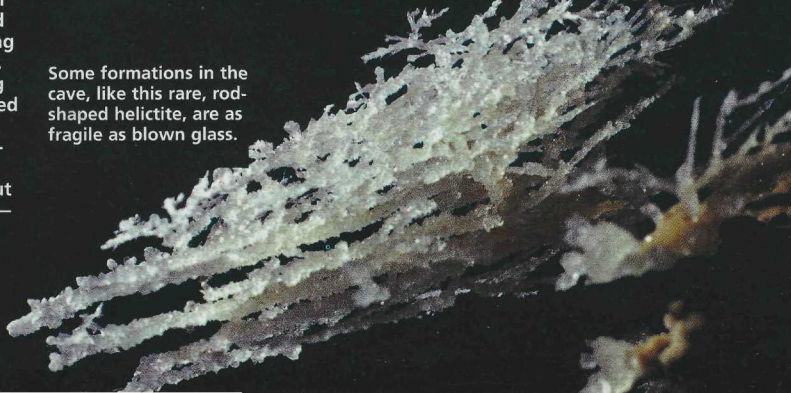
Cave. Another mineral, gypsum, appears in the fanciful shapes of flowers, needles, spiders, and cottony beards.

Scintillites, a type of formation unknown until discovered in Jewel Cave, are composed of the reddish rock called chert and a coating of sparkling clear quartz crystals. Two other intriguing formations discovered in Jewel Cave are hydromagnesite balloons (*left*)—fragile silvery bubbles about an inch in diameter—and moonmilk, a powdery substance looking like cottage cheese.

Scintillites (*right*): underground sparklers of tiny quartz crystals.



Some formations in the cave, like this rare, rod-shaped helictite, are as fragile as blown glass.



Exploring Jewel Cave

*The excitement of discovery,
the elation and despair,
The thrill of pushing forward
to discover what is there.*

Jan Conn, Jewel Cave explorer

Exploration of Jewel Cave began about 1900 when Frank and Albert Michaud, South Dakota prospectors, and their friend Charles Bush heard wind rushing through a hole in rocks in Hell Canyon. Enlarging the hole they found a cave full of sparkling crystals. They filed a mining claim on the "Jewel Lode" but found no valuable minerals. Instead they tried turning the cave into a

tourist attraction. The business was not a success, but the cave attracted attention, and Jewel Cave National Monument was proclaimed as part of the National Park System in 1908 to protect the small but extraordinarily beautiful cave.

Fifty years later exploration of the cave intensified. Led by the work of husband-and-wife team Herb and Jan Conn, modern cavers have discovered new wonders and explored more and more miles of passages. Today the cave is among the world's longest, and it is renowned for its variety of formations.



Brothers Frank
(standing) and Albert
Michaud, ca. 1890.

COURTESY OF IRA MICHAUD

Into the Unknown

When Herb and Jan Conn were asked to join a Jewel Cave expedition in 1959, the couple responded without enthusiasm. Their passion was rock climbing—not crawling around in dark, underground tunnels. But lured by the thrill of discovering yet another mile of never-before-seen cave, they spent much of the next 21 years in Jewel Cave.

Caving parties they led made 708 trips into the cave, logging 6,000 hours exploring and mapping. As their book *The Jewel Cave Adventure* says, this became their all-absorbing interest. With fellow cavers they typically spent

12- to 14-hour days underground. With hard hats, carbide lamps, gloves, loose fatigues, elbow and knee pads, and boots, they squeezed and crawled and climbed through Jewel Cave's complicated maze. On rest stops they ate mangled sandwiches and fruit—and massaged sore muscles. Passages they named tell the story: Contortionist's Delight and The Miserias.

With more miles discovered it was clear that Jewel Cave was one of the world's most extensive caves, full of scenic and scientific wonders. Explorers discovered chambers with exquisite calcite crystals



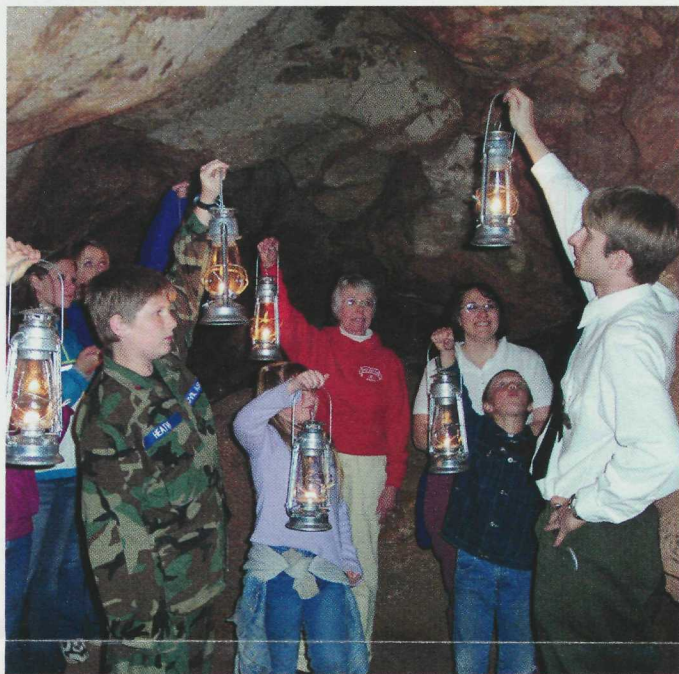
Herb and Jan Conn: "The thrill of discovery made everything else worthwhile." Caving maneuvers, they reported, ranged from mountain-climbing techniques to the undulations of an earthworm.

GARTHUR FALKER

and rare cave formations. The Conns found the decorated Formation Room that highlights today's Scenic Tour. They found rooms as big as 150 by 200 feet, passageways 3,200 feet long, and a place where the cave wind blows up to 32 miles per hour. The cave is indeed a rare and precious jewel.

Having discovered over 65 miles of cave, the Conns retired in 1981. A new generation of cavers has pushed that figure to over 140 miles of known cave. But the mystery remains. As the Conns have said, "We are still just standing on the threshold."

Cave Tours



The Lantern Tour (above) visits historic cave passages.

You can explore Jewel Cave on any ranger-guided tour, but group sizes are limited, and tours often sell out. The busiest times are usually from mid-June through August.

You may buy tickets for the Discovery Talk, Scenic Tour, and Lantern Tour at the visitor center or by phone up to seven days in advance. Reservations are required for the Spelunking Tour and can be made up to 30 days in advance by contacting the visitor center. For advance ticket sales or phone reservations call 605-673-2061.

Discovery Talk This easy, wheelchair-accessible, 20-minute introduction to the cave's cultural and natural

histories takes place in one large cave room. It begins at the visitor center with an elevator ride into the cave. Offered daily, year-round. Limit 20 persons.

Scenic Tour This ½-mile, 1¼-hour loop tour begins at the visitor center with an elevator ride into the cave. You follow a paved, lighted path and climb up and down over 700 stairs. Moderately strenuous. Offered daily all year. Limit 30 persons.

Lantern Tour This ½-mile, 1¼-hour tour, follows early cave explorers' paths. You can see calcite-coated cave passages by the light of lanterns. The tour starts at the Historic Ranger Cabin above the historic entrance

in Hell Canyon. Strenuous with steep stairs, it requires bending and stooping. It is offered several times daily, from early June through August. Children must be six or older. Limit 20 persons.

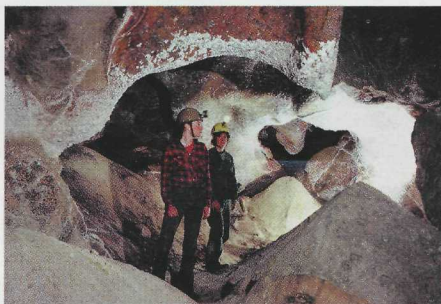


The Scenic Tour visits chambers decorated with calcite crystals and colorful stalactites, stalagmites, and draperies.

Spelunking Tour

On this ½-mile, four-hour tour you explore a wild, undeveloped part of Jewel Cave. The roundtrip tour begins at the visitor center with an elevator ride into the cave. Old clothes are recommended. Soft knee-pads and elbow pads, gloves, and lace-up, ankle-high boots with lug soles are required. The park staff will supply helmets and

headlamps. To qualify for this tour you must crawl through an 8½-by 24-inch opening in a concrete block. The tour is offered only once a day, from mid-June through mid-August, with a five-person limit. Children 15 years old or younger may not take this tour. Youths 16 and 17 years old must have written permission of a parent or guardian.



The park staff supplies helmets and headlamps for the Spelunking Tour, but please note the minimum age restrictions described at left.

Cave Safety and Regulations

- Low-heeled, rubber-soled shoes are recommended—for slippery trails and stair climbing.
- Wear a sweater or jacket for comfort in the cave's 49°F (9°C) temperature.
- Persons who have heart or respiratory problems, have been recently hospitalized, or who have a fear of heights or of closed-in spaces should talk with a

- park ranger before selecting a tour.
- Damaging or even touching cave formations is prohibited by law because formations are fragile and irreplaceable.
- Pets, food, candy, drinks, tobacco products, bags, purses, backpacks, and other large items are prohibited.
- Cameras are permitted but tripods are not.

Surface Activities and Information

Take time to experience the world above the cave. In the park's two square miles you can picnic, take a nature hike, and discover plants and animals of the Black Hills' rugged hill-and-canyon country. In the ponderosa pine forest you may see mule deer, white-tailed deer, porcupines, squirrels, chipmunks, and several species of birds. Plants of both prairie and mountains grow here, and in spring and summer wildflowers color the landscape.

Visitor Center The visitor center has information, publications, and exhibits on the area and the underground world. Rangers answer questions, help you plan your visit, and give occasional informal talks here. Up-to-date cave

information and tour tickets are available. A nearby path leads to an overlook with a panoramic view of Lithograph Canyon. The visitor center is open daily all year, except Thanksgiving, December 25, and January 1.

Historic Area and Cabin The Historic Area, open from mid-June through August, is located a mile west of the visitor center. The park's first ranger station—a cabin built by the Civilian Conservation Corps in 1935—has been restored to its historic condition.

Rangers in reproduction 1936 National Park Service uniforms answer questions and give information and informal talks. A trail to the cave's historic entrance—and to Hell

Canyon beyond—begins at the cabin.

Picnic Areas The park has two shaded picnic areas—one near the visitor center and one near Jewel Cave's historic entrance. Both areas offer picnic tables and are near drinking water and restrooms. No campfires are allowed, but you may use self-contained camp stoves in the picnic areas only.

Hiking The park has hiking trails. Ask a park ranger about routes.

Nearby Accommodations and Services The park provides no campgrounds or lodging, but other public lands and local communities offer them. Campgrounds are available nearby in Black Hills National

Forest, at Custer State Park, and at Wind Cave National Park. Custer, S. Dak., 13 miles to the east, has commercial campgrounds with RV hookups

Lodging and other services—restaurants, grocery stores, and gasoline—are offered in Custer; Newcastle, Wyo., 24 miles west of the park; and other communities. Contact the park or chambers of commerce for information on services.

Regulations and Safety • Destroying or removing any natural or cultural object is prohibited. • Do not disturb or feed wildlife. • Firearms and other weapons are not allowed in the park. • Fires are not permitted. • Pets must be on a leash.

More Information
Jewel Cave
National Monument
Building B12
11149 US Highway 16
Custer, SD 57730
605-673-2288
www.nps.gov/jeca

Jewel Cave is one of over 390 parks in the National Park System. The National Park Service cares for these special places saved by the American people so that all may experience our heritage.

To learn more about parks and National Park Service programs in America's communities please visit www.nps.gov.



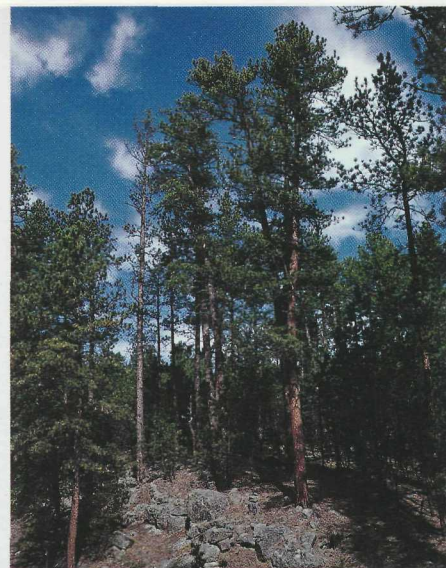
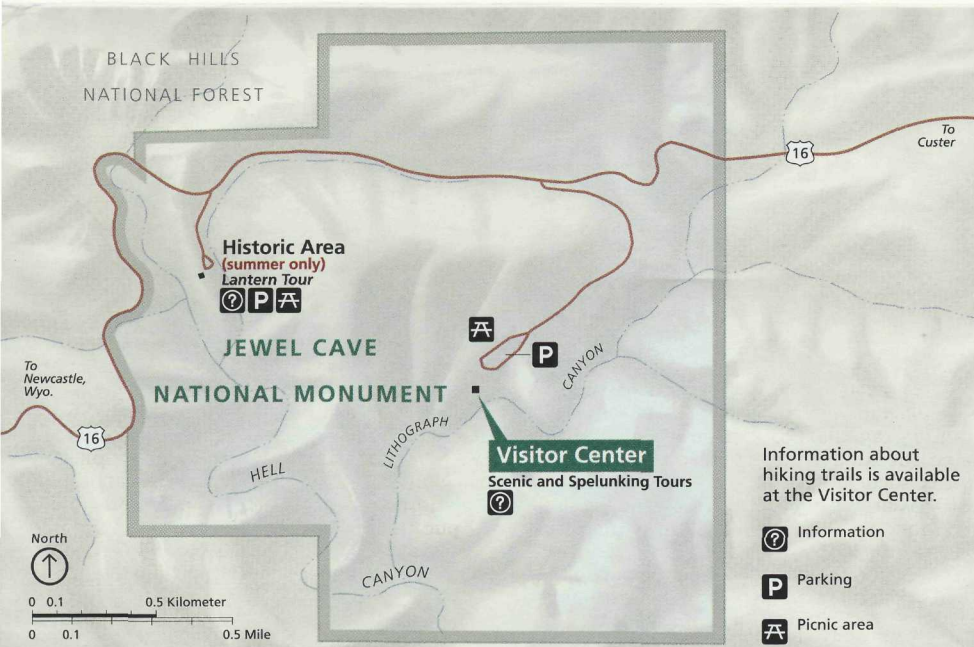
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Arrowleaf balsamroot in blossom (top), and great horned owl.

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Jewel Cave National Monument's above-ground world features ponderosa pine forests (above) in the rugged, hill-and-canyon country of the Black Hills.